IN THE CLAIMS

Please cancel Claims 9, 15-18, 25-35, 37, and 39-40 without prejudice, amend Claims 1, 7, 8, 19, and 38, and add new Claims 41-54 as follows:

1. (Presently amended) A method of locating a blood vessel disposed within surrounding tissue, comprising:

transmitting acoustic energy into said tissue including said blood vessel;

evaluating reflections of said acoustic energy from said tissue and said blood vessel, and

identifying at least one region of reduced energy reflection within said tissue, said at least one region corresponding to said blood vessel;

wherein said act of identifying comprises automatically detecting a local minimum.

2. (Previously presented) The method of Claim 1, wherein said act of evaluating comprises analyzing at least one A-mode line.

3. (Previously presented) The method of Claim 2, further comprising correlating said at least one region to a depth location within said tissue based on said act of analyzing said at least one A-mode line.

4. (Previously presented) The method of Claim 1, wherein said act of identifying comprises:

forming at least one integrated power representation based on said reflections; and

identifying at least one artifact within said at least one integrated power representation, said at least one artifact corresponding to the lumen of said blood vessel.

5. (Previously presented) The method of Claim 4, wherein the act of identifying at least one artifact comprises identifying at least one plateau within a normalized integrated power profile.

6. (Previously presented) The method of Claim 1, wherein said act of identifying comprises:

measuring the signal level of said reflections as a function of depth within said tissue; and

identifying the lumen of said blood vessel based on at least one feature identified during said act of measuring.

7. (Presently amended) A method of locating at least one wall of a blood vessel, comprising:

at least partly compressing some tissue surrounding the blood vessel;

transmitting acoustic energy into the blood vessel;

detecting at least one region associated with the lumen in said blood vessel based at least in part on a local minimum; and

detecting the location of said at least one wall of the blood vessel relative to said lumen;

wherein the act of detecting the location comprises analyzing A-mode data derived from said act of transmitting.

8. (Presently amended) A method of locating a blood vessel in tissue, comprising:

generating at least one beam of acoustic waves;

transmitting said at least one beam of acoustic waves into said tissue, said beam moving with respect to said tissue so as to ensonify different portions of said tissue as a function of time;

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receiving energy backscattered by said tissue and said blood vessel;

analyzing said backscattered energy to identify at least one ~~artifact~~ plateau therein, said at least one ~~artifact~~ plateau resulting from the lumen of said blood vessel; and

correlating said at least one ~~artifact~~ plateau to the location of said blood vessel.

9. (Cancelled)

10. (Previously presented) The method of Claim 1, wherein the act of identifying comprises:

determining a power metric from said reflections;

integrating said power metric to produce a power function;

normalizing said power function;

dividing said normalized power function into a plurality of intervals; and

evaluating at least one of said intervals to identify said artifact.

11. (Previously presented) The method of Claim 7, wherein the act of detecting at least one region comprises analyzing the power of reflected by said blood vessel and associated lumen as a function of position.

12. (Previously presented) The method of Claim 7, wherein the act of detecting the location comprises analyzing said A-mode data for variations in reflected power in at least one location relative to said lumen.

13. (Previously presented) The method of Claim 12, wherein said act of analyzing said A-mode data for variations comprises comparing the reflected power in said at least one location to that associated with said lumen.

14. (Previously presented) The method of Claim 13, wherein said act of comparing comprises comparing the reflected power corresponding to said at least one location to the mean power associated with at least a portion of said lumen.

15. – 18. (Cancelled)

19. (Presently amended) Blood vessel locating apparatus, comprising:

at least one transducer capable of transmitting an acoustic wave into tissue containing a blood vessel and receiving a plurality of echoes therefrom, said first transducer configured to generate first signals related to said echoes; and

B3 a processor, operatively connected to said first transducer, and configured to process said first signals to determine the location of the lumen of said blood vessel;

wherein said transmitting an acoustic wave further comprises sweeping transversely across said tissue.

20. (Previously presented) The apparatus of Claim 19, wherein said processor is adapted to determine a power profile associated with said echoes, and identify at least one artifact therein, said at least one artifact corresponding at least in part to said lumen.

21. (Previously presented) The apparatus of Claim 20, wherein said power profile is integrated over a variable corresponding to the propagation of said acoustic wave, and said at least one artifact comprises a plateau within said integrated power profile.

22. (Previously presented) The apparatus of Claim 19, wherein said processor is adapted to determine the Doppler shift associated with blood present in said blood vessel.

23. (Previously presented) The apparatus of Claim 19, wherein said processor is adapted to compare the signal level of at least a portion of said echoes and identify at least one artifact therein.

24. (Previously presented) The apparatus of Claim 23, wherein said signal level comprises an envelope-squared metric, and said at least one artifact comprises a reduction in the magnitude of said envelope-squared metric, said reduction corresponding to said lumen of said blood vessel.

25.- 35. (Cancelled)

36. (Previously presented) A method of locating a blood vessel disposed within surrounding tissue, comprising the steps of:

transmitting acoustic energy into said tissue including said blood vessel to generate reflections thereof;

receiving said reflections of said acoustic energy from said tissue and said blood vessel;

forming at least one integrated power representation to identify at least one region of reduced energy reflection within said tissue, said at least one region corresponding to the lumen of said blood vessel; and

locating said blood vessel based on the location of said lumen.

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37. (Cancelled)

38. (Presently amended) Blood vessel locating apparatus, comprising:

at least one <u>first</u> transducer capable of transmitting an acoustic wave into a blood vessel and receiving a plurality of echoes therefrom, said first transducer configured to generate first signals related to said echoes;

<u>at least one second transducer capable of obtaining pressure signals from said blood vessel;</u>

at least one signal converter, operatively coupled to said at least one transducer and adapted to produce second signals from said first signals;

at least one digital processor, operatively coupled to said analog-to-digital converter, and configured to process said second signals; and

a computer program running at least in part on said digital processor, said computer program being adapted to determine a power profile based on said second signals, and to determine the location of the lumen of said blood vessel based at least in part on one or more artifacts present within said power profile; said computer program further being adapted to measure pressure within said blood vessel based at least in part on said pressure signals.

39.- 40. (Cancelled)

41. (New) The method of Claim 1, wherein said act of evaluating further comprises detecting an envelope associated with said reflections.

42. (New) The method of Claim 41, wherein said act of envelope detecting comprises:

providing an A-mode representation of said reflections;

multiplying at least a portion of said A-mode representation by the sine and cosine functions to produce a demodulated signal; and

lowpass filtering said demodulated signal.

43. (New) The method of Claim 42, wherein said act of lowpass filtering comprises filtering with a FIR filter, said FIR filter having a plurality of coefficients associated therewith

B3 44. (New) The method of Claim 42, further comprising applanating at least a portion of said tissue in order to reduce interference.

45. (New) A method of locating a blood vessel disposed within surrounding tissue, comprising:

transmitting acoustic energy into said tissue including said blood vessel;

evaluating reflections of said acoustic energy from said tissue and said blood vessel; and

identifying at least one region of reduced energy reflection within said tissue, said at least one region corresponding to said blood vessel;

wherein said act of identifying comprises detecting at least one plateau.

46. (New) A method of locating a first blood vessel disposed within surrounding tissue, comprising:

applanating at least said tissue;

transmitting acoustic energy into said tissue including said first blood vessel;

evaluating reflections of said acoustic energy from said tissue and said first blood vessel, and

identifying at least one region of reduced energy reflection within said tissue, said at least one region corresponding to said first blood vessel.

47. (New) The method of Claim 46, wherein said act of applanating further comprises at least partly compressing one or more second blood vessels proximate to said first blood vessel.

48. (New) The method of Claim 47, wherein said act of at least partly compressing results in reducing interference with said act of identifying, said reducing of interference resulting at least in part from compression of said one or more second blood vessels.

49. (New) A method of locating a blood vessel disposed within surrounding tissue, comprising:

transmitting acoustic energy into said tissue including said blood vessel;

receiving reflections of said acoustic energy from said tissue and said blood vessel;

basebanding at least a portion of said received reflections to produce baseband data;

developing an envelope squared representation of said baseband data;

applying a depth-dependent gain to at least a portion of said envelope squared representation; and

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identifying said blood vessel based at least in part on the output of said act of applying.

50. (New) The method of Claim 49, further comprising decimating at least a portion of said data or said envelope squared resp.

51. (New) Blood vessel locating apparatus, comprising:

apparatus adapted to applanate at least tissue surrounding a blood vessel;

at least one transducer capable of transmitting an acoustic wave into said blood vessel and receiving a plurality of echoes therefrom, said first transducer configured to generate first signals related to said echoes; and

a processor, operatively connected to said first transducer, and configured to process said first signals to determine the location of the lumen of said blood vessel.

52. (New) The apparatus of Claim 51, wherein said transducer is coupled to said apparatus adapted to applanate, said transducer being urged by said applanating apparatus into said at least tissue to compress at least a portion thereof.

53. (New) A method of locating at least one wall of a blood vessel, comprising:

transmitting acoustic energy into the blood vessel;

receiving reflected energy from said blood vessel;

detecting at least one region associated with the lumen in said blood vessel from said reflected energy;

starting at said at least one region, computing an integrated power in a first direction;

evaluating said integrated power as a function of said direction; and

detecting the location of said at least one wall of the blood vessel based at least in part on said act of evaluating.

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54. (New) The method of Claim 53, wherein said received reflected energy is used to form A-mode signals, and said act of computing an integrated power comprises summing consecutive samples of the square of the envelope of said A-mode signals in said first direction.